

Degree of Impact of Applying Environmental Cost Accounting on Tax Revenues from Oil Companies Operating in Iraq

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Abstract

Protecting the environment and its natural resources is an issue of great importance at the local and global levels. The phenomenon of environmental pollution resulting from the work of oil companies is one of the dangerous phenomena facing the environment in Iraq in general, and the environment of Kirkuk Governorate in particular, as the latter is considered one of the governorates rich in mineral resources, especially oil, as it contains six oil fields, and it contains the largest oil field in Iraq. Estimates indicate that it produces (40%) of the total Iraqi oil, so it suffers from a significant increase in the proportions of toxic and environmentally polluting gases resulting from the work of these companies in it. The work of oil companies from exploration, extraction and refining oil will naturally result in the emission of many gases that are highly toxic, dangerous and harmful to human health. The most important of these gases are carbon monoxide, sulfur dioxide, nitrogen dioxide, hydrocarbon compounds, hydrogen sulfide and other gases that pollute the environment, which has resulted in the spread and increase in the number of patients with respiratory diseases in a clear and increasing manner in the governorate. This increase in environmental costs falls on society as a whole, so it was necessary to identify and measure environmental costs from the society's point of view and work to re-charge them to oil companies by applying the environmental tax.

Keywords: Cost Accounting, Oil Companies.

1. Introduction

Section One

Environment and Environmental Costs

Environmental Pollution

Concern for protecting the environment and its resources is one of the issues of great importance at the local and global levels, as concern for the environment has become mandatory and not optional, so many local laws and international environmental standards have been issued that oblige business companies to be environmentally responsible, to limit the aggravation of the pollution problem that has left negative effects (socially, healthily and economically), the main cause of which was human behavior.

Environment

Below is a table that addresses some of the definitions of the environment:

Source	Definition
Al-Qasimi, Al-Ba'ini, 13:1999	The space in which humans carry out their various life activities, and this framework includes all living organisms, animals and plants, with which humans coexist.
Shahata, 2001: 29	Monitoring the material and social resources available at a given time and place to satisfy human needs and aspirations.
Al-Husseini, 21:2009	A group of rare resources found on and within the planet Earth, including the surrounding atmosphere, and the scarcity of these materials makes it necessary to consider them types of environmental assets.
Hassouna, 2013: 3	The environment in which living things live, consisting of the Earth, its atmosphere, and what is on it and inside it.
Bouzir, 2015: 4	The environment in which man lives and the grey natural phenomena it contains, influencing and being influenced by them.

Table (1): Definition of the environment

(Source: Prepared by the researcher based on the above sources)

Environmental Components:

The ecosystem includes the following basic elements (Al-Qasimi and Al-Ba'ini, 1999:13):

1. Natural Material Elements: including water, air, soil, and other natural resources, plants, and animals.

The natural environment has been defined by the Environmental Protection and Improvement Law No. 27 of 2009 in Article Two/Paragraph Six, as consisting of water, air, soil, and living organisms.

2. Non-Natural Elements: including elements made by humans after causing changes to natural elements, resulting in the emission of pollutants into the environment, including the following, but not limited to:

A - Wastewater and sewage from residential areas and social institutions.

B - Pesticides used to treat agricultural pests.

C - Gases emitted as a result of burning various types of fuel.

D - Solid waste and industrial waste.

Environmental Pollution:

Pollution is linguistically defined as staining or mixing and is always associated with the presence of harmful substances or energies in the environment in which we live, in unnatural proportions and out of place, which may harm living organisms or humans in their safety, health or comfort (Al-Halou, 2002: 40). Environmental pollution is scientifically defined as the change that occurs in the biological, physical and chemical characteristics of the elements of the environment, both living and non-living, as a result of a change in the concentration levels of these elements or as a result of the entry of foreign elements in quantities greater than the environment can absorb, which leads to a disruption in the functions of the ecosystem, and this disruption in turn leads to the deterioration and destruction of the environment surrounding humans and various other living organisms, including animals and plants (Al-Lami, 2018: 26).

Pollution is one of the most important problems in the world today, which results from various industries that directly affect public health through air, water and soil pollution. On this basis, environmental pollution can be defined as “the undesirable changes that surround humans, wholly or partially, due to their activity through direct or indirect effects on the natural, chemical or biological components of the environment, which affects humans and the quality of life they live” (Mukhalif, 2007: 48). The Iraqi Environmental Protection Law No. (3) of 1997 also defined pollution as the presence of pollutants affecting the environment in an unnatural quantity, concentration or quality, which directly or indirectly leads to harm to living organisms and the environment in which they exist. Accordingly, the forms of pollution vary according to the environmental area in which pollution occurs and the sources from which it results, which is often human activity as the main source. Pollution takes several forms, including (Al-Taie, 2012: 5, 6):

- **Air Pollution:** This pollution is defined as the presence of various gases and elements whose density and rates exceed the natural rates, causing harmful effects on living organisms (Al-Salihi, 2008: 38), i.e. it is an expression of the change in the natural and chemical composition of the air, which may be in the form of particles in the air such as dust, and toxic gases such as carbon monoxide, sulfur dioxide, nitrogen dioxide, etc.
- **Water Pollution:** This pollution is defined as any case of change in the natural characteristics of water, making it a real or potential source of harassment or harm to legitimate uses of water due to the addition of foreign materials that cause turbidity in the water or give it a strange smell, color, or taste (Al-Hiti, 2002: 17), i.e. the presence of germs, chemicals, or industrial, human, and animal waste, which may reduce the quality, purity, and safety of water for direct human consumption. This pollution may affect water sources, whether oceans, seas, lakes, rivers, or groundwater, which may cause direct harm. Or indirectly on humans, animals and plants.
- **Soil Pollution:** This pollution is known as an imbalance in the components of the soil and the mixing of unfamiliar materials with the natural components of the soil, which negatively affects it, disrupting its chemical and physical composition. Pollution can be caused by an increase in the level of one or more components of the natural soil and an increase in its concentration. This pollution causes harm and danger to the lives of humans, plants and animals,

and is considered one of the most dangerous types of pollution (<http://mawdoo3.com>). Pollution has appeared on the surface of the Earth for a period that is not short, and in most cases, it was caused by random or intentional human activities that caused serious damage to the surface of the Earth, which subsequently affected human health and safety first and the environment second. Examples of this include burying nuclear and industrial waste in the ground and the random spread of waste landfill sites and their expansion at the same time, which led to soil pollution as a result of the many toxic materials it contains and the wrong government policies in many countries due to the excavation operations practiced on it, whether for the purposes of building roads or construction or to use tree wood for various purposes.

- **Noise Pollution:** This pollution is known as an unwanted sound that can affect human health by negatively affecting the individual's psyche, which leads to discomfort and then to aggressive behavior or even exposure of the individual to high blood pressure or sleep disorders and may sometimes lead to severe depression and other negative effects in the event of exposure to high levels of noise (Al-Samarrai, 1995: 27); Noise has many sources, including natural sources such as volcanic eruptions, earthquakes and thunder, or unnatural sources such as factory noise, electrical appliances, cars, loudspeakers, etc. (Al-Shajri, 2004: 24), and poor urban planning of cities may be one of the reasons for this type of pollution.

Environmental Pollution and Environmental Cost Accounting:

Environmental costs provide data and information related to the environmental performance of companies; below is a table containing some definitions of environmental costs:

Source	Definition
Environmental Protection Agency, 1995: 1	One of the different types of costs that companies incur when they provide goods and services to their customers.
Allam, 1996: 177	All elements of expenses generated as a result of the company fulfilling its responsibilities towards the surrounding environment.
Shapino, Stoughon, 2000: 3	It is the monetary and non-monetary effects of the company resulting from its activities that affect the quality of the environment.
Shahata, 2001: 203	Explicit and implicit costs incurred by the company as a result of carrying out its activities, in order to prevent or avoid environmental damage now or in the future.
Abdullah, 2002: 428	All sacrifices (explicit and implicit) made by companies in order to prevent or avoid environmental damage, whether to (water, air, soil, humans, animals) at present or in the future, as a result of their various activities.
Al-Khawli, 2004: 32	The process of identifying and measuring the monetary value of the environmental damage caused by a company to the surrounding environment as a result of its operations and manufacturing processes.
Girees, 2011: 155	The amount of environmental costs that companies incur in order to maintain the existing environment.
Al-Ubaidi, 2019: 422	Costs incurred by companies for the purpose of producing and marketing environmentally friendly products and for implementing laws and regulations related to environmental protection.

Table (2): Definition of Environmental Costs

(Source: Prepared by the researcher based on the sources in the table above)

Environmental Costs Characteristics:

Environmental costs have a set of characteristics that distinguish them from other costs, including: (Badawi, 2007, 67)

1. Difficulty in measuring and estimating them due to their complexity, lack of disclosure, and lack of accuracy in knowing what environmental and non-environmental costs are, or mixing them up, such as including environmental costs within indirect costs, which makes it difficult to measure or measure them accurately.
2. Difficulty in comparability between industrial companies with different activities, as each industrial company pollutes the environment differently from another industrial company depending on the difference in its activity, and thus the costs borne by each company differ, making it difficult to compare between companies.
3. Allows for the availability of material information about the value of pollution and its effects resulting from companies' activities.

Environmental Costs Importance:

Environmental costs are important in the following (Bouzir, 2015: 9-10)

1. They help and motivate companies to take environmental considerations into account when evaluating projects, and therefore many parties (internal and external) seek to obtain environmental reports on companies' activities, and these reports are used to improve companies' work, influence decision-makers, and research and evaluate uncalculated risks for creditors (Nour, 1990: 30).
2. They help raise the efficiency of the applied cost accounting system when they are included in cost elements, which means achieving a more accurate measurement of companies' performance in terms of income and wealth.
3. They enable companies to increase their profits by reducing or preventing the environmental costs paid by companies, and achieving a competitive advantage among companies (Saleh, Ismail, 1999: 280).

Objectives of Applying Environmental Cost Accounting:

The objectives of environmental cost accounting that seek to manage environmental, economic, ethical and social performance can be identified through:

1. Preparing and developing appropriate accounting systems related to the environment and its applications, including the accounting reporting and investigation process, in addition to the product life cycle cost processes, total cost accounting, benefit evaluation and strategic planning for environmental management to achieve corporate goals (Masoud, 186:2018), i.e. achieving better management of environmental costs and helping companies measure environmental costs, which in turn contributes to rationalizing pricing decisions and correctly measuring the cost of each product at the company level.

2. Conducting a correct assessment of the impact resulting from the companies' production activity on the environment, so the total expenses incurred by the unit voluntarily or as a result of legal settlements that come into effect in renewing or protecting the environment as a result of the activity being carried out depends on environmental costs. (RAKOS & ANTOHE 2014:170), which means identifying the negative impact of operational processes on the environment and discovering new ways to reduce these impacts (Zahran, 2003:20).

Classification of Environmental Costs:

Environmental costs can be classified into the following basic elements (Al-Sufi et al., 2012: 221):

1. Environmental costs in the research and development stage: This refers to the amount of money invested to improve the types of products that comply with global environmental requirements, and also includes expenses spent on environmental matters, i.e. they include all costs related to studying the possibility of innovating and developing environmentally friendly products that meet environmental needs that do not harm the health of the customer on the one hand, nor the environment and society on the other hand.

2. Environmental costs in the design stage: These are the costs of determining the appropriate processes to achieve the targeted environmental performance quality and determining the specifications of the inputs that reduce the negative environmental impact, meaning that the design of the production processes must take into consideration that the raw materials used in production are not harmful to the environment, and the machines used must be new and feature clean technology and do not result in environmental damage, in addition to relying on workers who have environmental awareness, all in order to achieve environmental performance quality.

3. Environmental costs in the production stage: These are the costs of inspecting and maintaining devices and equipment to improve environmental performance and the costs of removing environmental damage as soon as possible, such as the costs associated with caring for the land and soil, such as protecting natural landscapes, replanting and repairing polluted sites resulting from the implementation of this stage (Bouzir, 11:2015).

4. Environmental costs in the marketing stage: These are the costs associated with selecting and using packaging materials for products that do not cause environmental damage and are easy to recycle, and also include the costs of printing the environmental report and activities related to communicating with the community and the costs of caring for environmental activities (Bouzir, 12:2015).

5. Environmental costs in the after-sales stage: These are the costs associated with customer complaints (after-sales services) resulting from environmental damage such as damage from the emission of harmful fumes from the use of a specific device or fines and taxes paid as a result of hazards and violations of environmental legislation.

Evaluating Environmental Costs and its Obstacles:

Accounting measurement methods have witnessed a significant development with the expansion of the scope of accounting to include economic institutions in measuring their impacts on the

environment resulting from their practice of activities that affect the environment, therefore accounting information gains special importance in the accounting field to help various parties in making decisions; Environmental accounting measurement is defined as determining the values of all cost elements generated by obligating companies to certain environmental responsibilities, whether optional or mandatory (Al-Shahada, 2010: 283), i.e. translating the company's activity in the environment in a quantitative or financial manner through which environmental information can be obtained that explains the company's financial statements to users.

Accordingly, environmental accounting measurement must include three elements, which are:

- Amounts paid by companies to government agencies.
- Amounts borne by companies voluntarily.
- Damages borne by society.

Application Requirements Environmental Cost Accounting:

The application of environmental cost accounting requires the availability of many basic components (accounting tools), and these components include (Al-Hussaini, 2009: 57):

First: The documentary group: To provide data on environmental obligations, documents must be designed that are compatible with such data, and the data for these activities in environmental cost accounting are either financial or quantitative (descriptive), and with regard to financial data, it is possible to rely on what the accounting system provides in terms of documents, and as for quantitative data or technical measurements, a group of documents can be prepared to obtain different data for this purpose. The financial department in the public administrations in the state must submit reports on pollution and its rates, such as estimating the funds needed to implement environmental programs and determining the time period for that, and of course, implementing programs to protect society from pollution requires determining the implementation stages, which may take several years, as this matter is related to the state's capabilities, its executive authority, the required technological level, and its ability to enact the necessary legislation and laws to implement its policy in protecting society.

Second: The set of records: These records are divided into two types:

1. The journal and ledger: A record in which all operations and activities in the environmental field of a financial nature are recorded, as well as the cost of assets used for environmental purposes. The same records approved in the financial accounting system can be used here.
2. The metadata record: A record in which all operations with metadata related to the environment are recorded. These records are a means of analyzing operations and activities related to the environment. One of the suggested examples of such records is the record of monitoring gases emitted from the activities of oil companies. However, what is wrong with using these records is the difficulty of estimating the financial value of environmental damage. It is not easy to estimate the financial value of all environmental damage, as some of them have a market value, such as the loss of fish and coastal wealth, and others do not have a market value, such as harm to human health as a result of pollution (Al-Sayed, 2006: 17). Third: Accounts

Guide: A list that includes every account owned by the company, its type and its balance. The balance sheet and income statement accounts are arranged according to a specific pattern and style that is consistent with its activity for displaying data. This guide aims to facilitate the collection, recording and tabulation of financial data for all environmental company activities.

Methods and approaches to measuring environmental costs:

The most important methods suitable for accounting measurement of environmental costs are as follows (Al-Sayed, 2006: 123-126):

First: Methods and approaches that depend on traditional markets: This group depends on market data and indicators through the following methods: 1. Response or impact method: This method depends on estimating the relationships between exposure to pollution quantities and their impact on assets, whether human or material, such as buildings, machinery and equipment. This type of method is based on the existence of a causal relationship between pollution and the impact it has on human, material and natural wealth. Therefore, this method aims to measure environmental costs more accurately and fairly. For example, the costs of illness resulting from pollution can be measured by measuring direct and indirect costs as follows:

A. Direct costs: These include the costs of treating patients resulting from pollution, represented by hospital, nursing and health care costs.

B. Indirect costs: These include the costs related to the inability of the affected person to work as efficiently as he was before contracting diseases caused by pollution and environmental damage and can be measured by decreased productivity as the costs of premature death incurred as a result of lost productivity.

To apply the response or impact method, the following data must be available:

- Estimating the concentration levels of pollutants
- Determining the relationship between certain concentrations of pollutants and the general health of human resources.
- Determining the size of workers or population exposed to the risk of pollution.

3. The method of impact on productivity: This method is based on observing the physical change in production associated with certain changes in the environment. Air pollution can negatively affect agricultural productivity, i.e. a decrease in production in quantity and quality, and pollution may also lead to the erosion of agricultural soil and thus a decrease in its productivity. To calculate the economic value, the following equation can be used:

$$\text{Economic value of change} = \text{amount of decrease in agricultural productivity in quantity} \times \text{price of ton sold in the market}$$

Second: Methods and approaches that rely on implicit markets: The method relies on using the prices and quantities of certain goods and services to evaluate the characteristics of those goods and services despite the direct exchange of those goods and services in the markets. Examples of those methods include:

1. Real estate value method: The value of the property is determined by the advantages of the location of this property, population density, the view it overlooks, and the quality of the air. The price of the property represents the sum of the previous values combined, and assuming the stability of the previous factors except for the environmental factors, the environmental impact on the price of the property is determined, represented by noise. Many studies have proven that the prices of the property decrease when it is close to the source of pollution when compared to its counterpart that enjoys the same advantages, but in an area free of pollution (Hamad, 2014: 69).

2. Wage differences method: This method is similar to the property value method in its theoretical foundations, but differs from it in determining the extent of individuals' acceptance of wage increases and exposure to health damages resulting from pollution, such as contracting various diseases associated with exposure to pollution and premature death, in exchange for wage increases and comparing these wages to less polluted areas, where the difference between the two values represents the cost of pollution that individuals are willing to bear in exchange for bearing the risks of pollution and the resulting damages.

Obstacles of Environmental Costs Evaluation:

The process of measuring environmental costs by accountants faces several obstacles, the most important of which are (Al-Shahada, 2010: 287-288):

1. Determining the causal relationship between the illegal act and the resulting damage. This factor raises several problems, including:

- Distance: It is difficult to accurately determine the distance separating the source of the damage from the place where the damage occurred, such as air pollution, water pollution with radioactive waste, or smoke pollution that does not know specific boundaries.
- Estimating compensation: Sometimes it is difficult to estimate compensation in the event of pollution. In certain cases of pollution, such as chemical pollution, whose effects do not appear directly, but remain latent and then appear after several years, it is difficult to estimate the extent of losses and damages immediately after they occur.
- Difficulty in identifying types of pollution: Sometimes it is difficult to determine the source of pollution or the type that causes damage and affects plants, animals or even buildings, which may occur as a result of the interaction of several types of pollution, such as polluting river water by dumping waste or discharging factory water.
- Difficulty in identifying the effects of pollution: It is scientifically proven that sources of pollution do not always produce similar results, because natural conditions play an important role in this area. Dumping polluted waste into the river does not cause the same damage during the period of water movement. There are also other factors such as wind, sun and fog that can

affect air pollution, and here it is difficult to attribute damage to a specific source, and thus it is difficult to measure this damage.

2. Difficulty in determining the perpetrator of pollution definitively: According to the general rules of legal liability, the person causing the damage must be identified. It is difficult to determine the person causing the damage, as in the case of air pollution from fumes emitted from car exhausts or factories, due to the multiplicity of persons responsible for this damage.

3. Difficulty in determining the damage to the environment: Given the difficulty of restoring the situation to what it was before the damage occurred in the case of environmental damage, the issue of determining the damage becomes necessary in order to estimate the value of compensation, which is a difficult issue to measure because it varies from one case to another, in addition to the fact that the measurement here is done approximately and personal factors intervene in it.

Environmental Pollution and Environmental Cost Accounting:

Environmental pollution has negative effects on the economic activity of individuals and society alike, and these effects can be summarized as follows (Al-Saadi, 2011: 36):

1. Decreased worker productivity due to diseases that he is exposed to as a result of pollution.
2. Negative impact on the productivity of agricultural crops, which leads to a shortage in the supply of food products.
3. The emergence of new needs required by the individual that must be satisfied not for the purpose of achieving social welfare but to reduce suffering, such as increased medical expenses resulting from diseases resulting from pollution or preventing them.

Section Two

Oil Companies and Tax Accounting

The activity of oil companies is considered one of the important activities due to its economic impact in most countries due to the large amount of tax revenues obtained from this activity. Naturally, this activity is one of the basic activities subject to tax. In this section, we will review oil companies as an introduction before learning about the tax accounting process and the mechanisms followed to complete this process with these companies.

Oil Companies:

The interest in oil increased after its importance became clear through the increase in its consumption, so it became an effective role in the economies of producing and consuming countries alike, due to its association with economic development issues. Oil became the primary source of energy in the modern era, and as a result, the oil industry expanded significantly, and oil exploration became the main concern of all countries of the world, especially Arab countries, as the latter contracted with investing companies.

Oil Contracts: The relationship between countries and investing oil companies is based primarily on organizing a contract known as the oil contract, and historically there are several types of oil contracts; The following table shows the types and nature of some oil contracts:

Contract Type	Nature and Scope of the Contract
Concession Contracts	It is an agreement between the oil-producing country and the foreign investing company; whereby the latter is granted the absolute right to search and explore for oil in the contract area, which covers most of the territory of the oil-producing country. According to these contracts, the oil produced is owned by the foreign investing company in exchange for financial obligations to the producing country in the form of royalties, symbolic amounts, or other obligations. Traditional concession contracts spread rapidly in the first half of the last century, as many oil countries concluded these contracts, most notably Iraq, Saudi Arabia, and Iran.
Participation Contracts	It is an agreement between the oil-producing country and the foreign investing company, with the aim of establishing a joint venture, called the company implementing the agreed upon oil operations within a specific area and for a specific period; where the foreign investing company undertakes exploration, drilling and production, in return for obtaining a percentage of participation in the oil reserves and production; this type of contract became widespread in the second half of the last century.
Oil Production Sharing Contracts	It is an agreement between the producing country and the foreign investing company, whereby the latter undertakes the operations of searching for, exploring and exploiting oil; thus, it bears all the risks of exploration in exchange for obtaining a share of the oil production exempt from taxes and at a preferential price. This type of oil contract appeared in Indonesia when its oil law was issued in 1961.
Oil Service Contract	It is the contracting of the producing country with a foreign company investing in the oil sector, in order for the latter to provide specific oil services and works for the benefit of the first party, within a known period of time and a specific area of work. The most important features of these contracts are that ownership of the oil remains exclusively for the producing country and the foreign investing company does not own any share in the oil produced or the reserve. The first oil service contract to be signed was in Iran in 1966.

Table (4): Types of Oil Contracts

(Source: Prepared by the researcher based on Hassan, 2017: 22-28).

The oil contract is a contract concluded by the state with one of the oil investment companies to invest in its territory; and through what has been reviewed from the types of oil contracts, we conclude that the last type (the oil service contract) preserves the state's strength and independence; to achieve its ambition in economic development if those contracts are exploited properly and in accordance with the drawn economic plans, and also the foreign company (the investor) is according to this contract as a contractor subject to the laws and regulations of the state, which undoubtedly includes the tax law; which allows the state to obtain tax revenues as a result of the activity of those companies on its lands.

In general, these contracts consist of three main pillars, which are:

A. Contract terms: The terms of oil contracts differ according to the nature of each type, but in general they should be determined by the implementation of oil operations and any other conditions agreed upon under the contract.

B. The foreign company (the investing party): It is naturally a legal entity that undertakes under the contract to implement the agreed upon oil works; it may be in return for a specific fee that represents investment revenue subject to tax (depending on the type of contract).

C. The producing country (beneficiary): is the party that offers oil contracts and their terms according to their type and needs, and may undertake to pay the financial dues owed to the investing company. Below is an illustration of the main pillars of oil contracts:

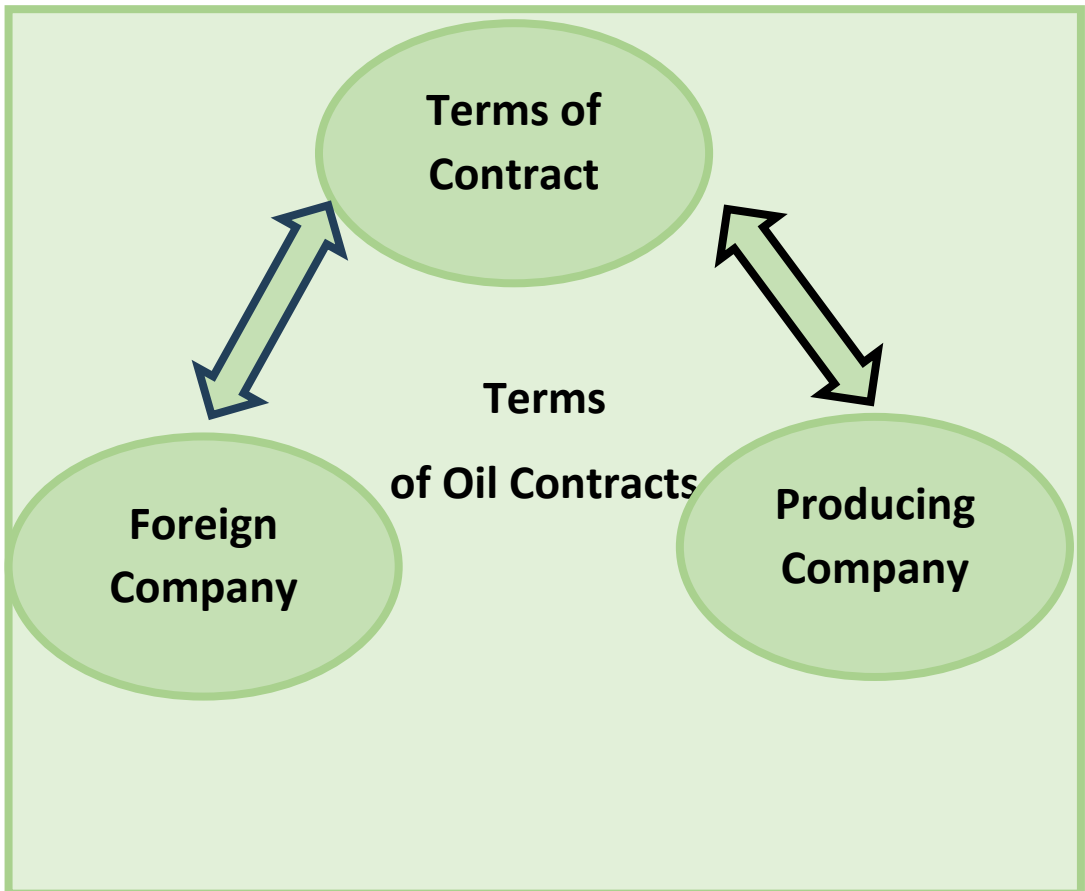


Figure (1): Pillars of oil contracts

(Source: Prepared by the researcher based on the above source)

Characteristics of Oil Companies:

Oil companies are characterized by two basic features (Al-Dinori, 2014: 43):

1. The advantage of integration: The advantage of integration that distinguishes oil companies in the oil industry can be attributed to several factors, including:

A. Crude oil is not consumed directly, but rather undergoes conversion processes into products that can be consumed directly, which requires refining operations.

B. Oil is located in areas far from consumption areas, which requires its transportation and distribution to consumption areas; which required oil companies to have all the necessary means to deliver oil to the final consumer in the desired form.

2. The advantage of monopoly: The other advantage that distinguished them is that they were subject to the monopoly of the few (control of a small number of companies). As is known, the seven oil companies, until the end of the sixties of the last century, continued to control the large percentage of oil industries.

Stages of the oil industry:

The nature of the work to implement oil contracts requires several stages of implementation; Each stage is characterized by the fact that it can be implemented completely independently of the next stage (Mustafa, 2006: 83), and the stages of the oil industry are (Karim, Don Sana: 1):

First: Exploration stage:

The term exploration means searching for something in order to obtain it. Oil exploration is searching for oil in order to obtain it. For more than a century, geologists have been searching for oil, and during this period, important discoveries have been made in many places in the world. This stage includes complex geological and geophysical surveys of different areas and analysis of rock layers in order to determine the area in which the exploration activities will be carried out, so that companies can then obtain oil contracts that entitle them to explore for oil in the specified areas (Al-Dinuri, 2014: 46).

Second: Exploration and drilling stage:

After completing the identification of the area in which oil is likely to be found, the next step begins with obtaining a contract to carry out the drilling process; Drilling is considered one of the best ways to show the possibility of the presence of oil or not in a certain area, as wells are drilled in dry areas as well as areas submerged in water using drilling towers and special equipment for each area.

Third: Production and transportation stage:

1. Production: These are the quantities of specific and known oil wealth extracted from the earth's interior during a specific period of time that may be a day, a month, or more. Oil is extracted in a way very similar to obtaining groundwater (Al-Douri, 1983: 39).

2. Transportation: This is the process of transporting oil from production well areas to crude oil refineries. Oil is transported mainly via pipelines, tankers, flatbed ships, tanker trucks, and tanker railway cars (Al-Qadi et al., 2001: 11).

Fourth: Refining stage: Refining means rearranging the molecules composed of hydrogen and carbon to form groups that differ from those present in it into forms of various petroleum commodity products. It is like sifting the oil material in order to obtain petroleum products of various types. Refining or purifying crude oil is based and depends mainly on the process of heating the oil at different temperatures and converting it from its liquid form to its gaseous form and condensing it again to transform it into a liquid according to the required and specified temperatures to obtain types of petroleum products (Abdullah, 2001: 24).

Environmental Impact of Oil Industry

The oil industry, with its various operations, is a major source of environmental pollution in general. The oil industry has a noticeable impact on the environment through all stages of the oil industry and the accompanying emission of many pollutants that are harmful to the environment from the beginning of the research, exploration and exploratory drilling stage until it is delivered to the final consumer. Oil environmental pollution is defined as: the release of gaseous, liquid or solid elements or compounds from oil into the elements of the natural environment, which leads to a change in the presence of these elements. The damage of oil pollution is distributed to all forms of human life and living organisms (www.ams.uokerbala.edu.iq). The environmental damage resulting from the oil industry can be divided into pollutants (gaseous, liquid, solid) as follows (Al-Lami, 2018: 36):

First: Gaseous Pollutants: They include vapors, toxic gases and ultra-fine particulate matter that remains suspended in the air. These pollutants are among the most common pollutants in the oil industry as a result of burning gases resulting from oil extraction and refining operations, or as a result of burning fuel inside oil facilities. The most important types of these pollutants are the following:

1. First: Gas Carbon Monoxide: It is a colorless, tasteless, and odorless gas. It is lighter than air and oxidizable; it turns into carbon dioxide and dissolves in blood plasma as much as it dissolves in water. Carbon monoxide is one of the most polluting gases in the air.
2. Hydrocarbons: It is a combination of hydrogen and carbon; hydrocarbons are toxic substances that cause serious diseases in humans such as liver and kidney damage, respiratory infections, and pulmonary calcification.
3. Volatile Organic Compounds: They are organic chemical substances that are easily volatile so that they evaporate in large quantities and enter the atmosphere under normal conditions. These compounds affect human health, as they affect the skin and eyes, as well as the respiratory system, causing bronchitis, emphysema, allergies, asthma, and others.
4. Nitrogen Dioxide: It is a yellowish-brown gas that reacts with water to form nitric acid and nitrous acid, which are a source of pollution by acid rain, which causes agricultural problems through its effect on the movement of natural elements in the soil, which increases with the

increase in its acidity, which negatively affects its productivity and the growth of plants in it, and even causes the fall of its leaves, flowers and buds.

Second: Liquid pollutants: Crude oil and its derivatives are one of the most important water pollutants characterized by their rapid spread during refining, loading, unloading, transporting, exporting and storing operations or during maintenance operations of oil facilities. The process of refining a ton of oil requires about (15) cubic meters of water, in addition to the volume of polluted water resulting from the added chemicals released from the oil refinery will be around (3.5-5) cubic meters) Quality, Jaafar, 2018: 33), and the most important effects of liquid pollutants are:

1. The arrival of these pollutants to water sources, especially drinking water, leads to their pollution. In addition to their toxicity, oil compounds give the water an unpleasant odor that is difficult to get rid of. Also, the use of water polluted with oil materials to irrigate crops will lead to their damage. Also, the pollution of lakes and rivers with oil leads to harm to aquatic organisms, which results in a decrease in fish quantities and the deterioration of fish stocks in particular (Al-Saad, 2006: 161).

2. The arrival of these pollutants to the soil, especially agricultural lands, leads to its pollution; thus, making them unsuitable for agriculture because they contain toxic organic materials that include many dangerous compounds; these compounds work to destroy all types of soil and transform it from fertile agricultural soil to sterile soil that is of no use. On this basis, liquid oil pollutants will inevitably lead to a reduction in agricultural areas, thus threatening human food security, health security, and sustainable human development (Iraqi Ministry of Environment, 2006: 9).

Oil Contracts and Taxes:

The activity of oil companies, like other activities, is directly linked to the environment in which they operate, and as a result, they will affect and be affected by it. Therefore, the social and economic conditions, including tax aspects, reflect the great impact on the oil sector, due to its great impact on imposing taxes and tax revenues. These contracts are processed according to approved accounting rules and standards, not randomly or spontaneously. Through this, tax accounting can be done in a sound and fair manner if efforts are combined between the parties responsible for setting accounting rules and standards on the one hand and the tax administration on the other hand, which certainly seeks to keep pace with the developments and changes that occur in the accounting or tax field in order to raise the efficiency of work and achieve the financial, economic, social and political objectives of the tax. This relationship can be explained through:

A. Legal framework: Based on the principle of the legality of imposing the tax, which means that the tax is not imposed, modified, exempted or collected except by a law issued by the legislative authority, and by virtue of the huge size of the revenues of oil companies operating in Iraq; The revenue of these companies (for example) in 2012 was estimated at about (94) billion dollars (Al-Taie, 61: 2015), and thus this is the largest source of income among the rest of the income of companies that practice various economic activities in Iraq. It was necessary to know the legal framework for imposing tax on oil contracts, as the integrity of all procedures related

to the tax must be based on this principle that has become a part of life. Oil contracts have been subject to tax in most legal legislations in various countries of the world, as the profits obtained from such contracts are subject to income tax; Naturally, the Iraqi Income Tax Law has subjected oil contracts to tax, as all the activities of oil companies established in Iraq are subject to tax under the Income Tax Law on Foreign Oil Companies Contracted to Work in Iraq No. (19) of 2010 and its instructions No. (5) of 2011 imposed on foreign oil investment companies operating in Iraq, where Article (1) thereof imposes an income tax of (35%) thirty-five percent on the income generated in Iraq from contracts concluded with foreign oil companies contracted to work in Iraq or their branches or offices and subcontractors with them in the field of oil and gas production and extraction and related industries; and the imposition of the tax under Article (1/first) of the instructions above includes the following contracts:

- Contracts for exploration, development and production of exploratory blocks and oil and gas fields.
- Seismic survey.
- Drilling wells.
- Well reclamation.
- Technical operations related to wells, including lowering the liners, naming, reviving wells, electrical sounding and completing wells.
- Surface facilities for oil and gas extraction and production operations and related industries.
- Water injection facilities.
- Flow pipes.
- Gas processing plants.
- Cathodic protection.
- Engineering inspection and quality control related to oil industries.
- Drilling water wells.
- Activities related to extraction until the oil or gas is ready to be pumped to export outlets.

B. Annual Tax Revenue: The activity of oil companies has gained great importance in various countries, especially in Iraq, due to the major role this activity plays in financing the state's general treasury. The clear emergence of this activity in Iraq was a result of the following reasons (Al-Taie, 2015: 47, 63):

1. The general budget in Iraq depends mainly on oil revenues.
2. The weak contribution of non-oil revenues to the general budget of Iraq when compared to both developed and developing countries.
3. Oil revenues contribute to building an economic base that provides renewable (non-exhaustive) income; If it is properly exploited and employed in the development process, so that

the country has the ability to continue economic life without being affected or with minimal impact upon the final depletion of oil.

4. Imposing an income tax on profits generated from oil contracts with foreign companies operating in Iraq is one of the appropriate financial tools for dealing with this sector with regard to the situation in Iraq.

Based on the above, it can be said that the size of the huge contracts assigned to oil companies is the main reason through which they achieve huge profits that expand the size of the tax base, and accordingly, the tax on the revenues of oil companies' contracts is the main source of tax revenues in Iraq.

The concept of tax accounting for oil companies:

Taxes are one of the economic tools through which the state can implement its policy (political, economic, social), and taxes are among the economic tools that the state can impose in order to protect the environment from various forms of pollution, and the financial authority is naturally responsible for implementing the tax policy drawn up for it by the state, which is done by converting tax provisions and legislation into practical steps and procedures on the ground, which reflects the extent of the success of that administration in the tax accounting process, the concept of tax accounting generally consists of two administrative and accounting aspects, the first is concerned with implementing the provisions of tax legislation and working to apply and embody them in economic and social life, while the second is concerned with converting accounting profit to tax profit in order to determine taxable income, and both of the aforementioned aspects are the core of the work of the tax administration in Iraq (the General Tax Authority and its branches).

Definition of Tax Accounting:

The following table provides some of the definitions of tax accounting that researchers have addressed:

Source	Definition
أمين، 2000 : 51	One of the components of the tax system that is concerned with implementing the provisions of tax legislation. It is the one that undertakes the application of the provisions of tax legislation and seeks to embody them on the ground.
الهائشمي، 2005 : 31	The mechanism that requires administrative and legal procedures, and the adoption of tax laws to deal with the taxpayer from the accounting and administrative point-of-view.
البعاج، 2011 : 19	Coordinated and interconnected administrative, accounting and legal procedures towards taxpayers for the purpose of efficient tax collection in accordance with the applicable tax law to achieve the objectives of the state's tax policy.
الراضي، 2012 : 49	The procedures used by tax assessors in the Iraqi General Tax Authority to extract accounting profit from it and arrive at tax profit.

Table (5): Definition of tax accounting

(Source: Prepared by the researcher based on the sources listed above)

Taxpayers (oil companies) and tax accounting:

The concept of taxpayers varies according to the nature of the source of income in each tax law and the type of tax. Paragraph (4, 5) of Article (1) of the Iraqi Income Tax Law No. 113 of 1982 states that “it is the natural or legal person. A legal person is any administration and institution that the law grants a legal personality to, such as associations of various types and companies known in the sixth paragraph of this article.” Article One, Paragraph Two of Instructions No. (5) of 2011 to facilitate the implementation of the provisions of the Law Imposing Income Tax on Foreign Oil Companies Contracted to Work in Iraq No. (19) of 2010, as amended, defined the foreign company as “a company established under foreign laws.” The Iraqi Income Tax Law No. 113 of 1982 imposed duties and obligations on taxpayers by subjecting them to tax accounting in the mechanism and manner it established, and in return, it granted them rights, the most important of which is the right to submit a tax return, which is defined as a statement submitted by taxpayers (companies Foreign oil companies), as by virtue of this declaration, the taxpayer determines his taxable income and thus the amount of tax due, within the procedures and instructions issued by the tax administration, and submits a declaration signed by the company's managing director and the legal accountant on the accuracy of the estimate and the amounts contained therein (Abu Nassar et al., 2005: 14), and this is considered an advanced scientific and practical method in dealing with the results of the work of income taxpayers (Al-Hashemi, 2005: 22), and as for the responsibilities of taxpayers (foreign oil companies), they are represented by keeping and maintaining sufficient and appropriate records, provided that they achieve reliability for the financial authority (Al-Khorasan, 2006: 46).

Below is an illustrative figure of the most important procedures that foreign oil companies must take to complete the tax accounting process:

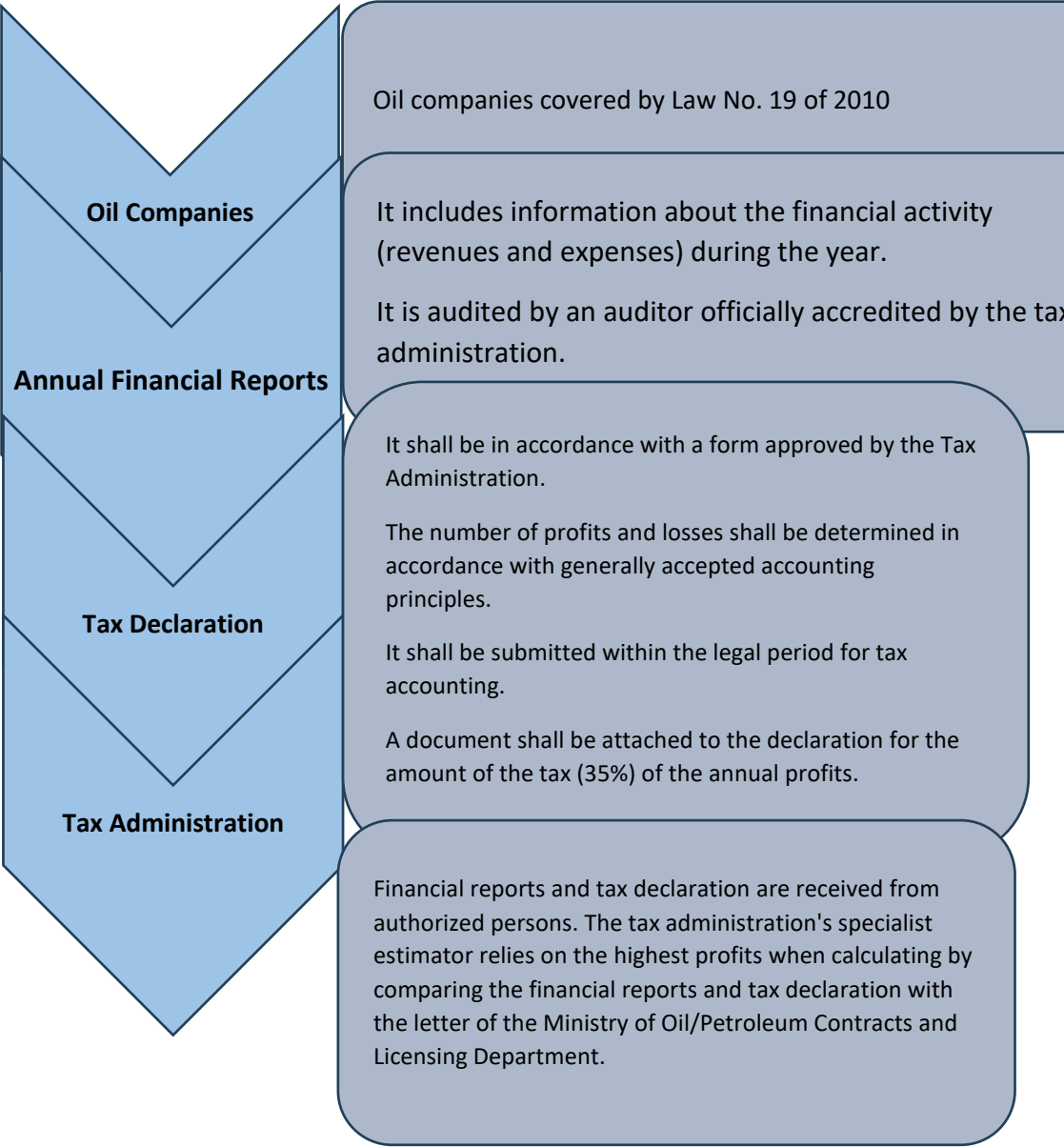


Figure (2): Oil companies’ procedures for tax accounting
(Source: Prepared by the researcher based on Al-Kharasan)

Tax Administration:

Tax administration is the main pillar of the tax accounting system (Al-Kaabi, 2016: 77); it is every collective effort or activity within public government institutions that aims to complete or implement work through employees by planning, organizing, coordinating and monitoring their efforts and actions and using material capabilities in the best possible way. In order for the tax administration to exercise its activity, it must be established in accordance with the law and specialize in implementing the tax law and verifying the integrity of its application in order to protect the interests of the public treasury and the rights of taxpayers alike (Sharab, 2006: 19). Naturally, the tax administration needs support and assistance from governmental and non-governmental institutions to provide it with information and data about taxpayers (individuals and companies), the nature of their activities and sources of income; after that, the data and information received from these institutions are processed to conduct the tax accounting process related to identifying taxpayers and their sources of income (Al-Suwaiti, 2008: 54). There are several definitions of tax administration, including:

Source	Definition
Iraqi Income Tax Law, 113 of 1982 (Article 1, Paragraph 13)	"An employee or group of employees to whom the Minister delegates the powers stipulated in this law."
(Ismail, 2001: 57)	A government department that supervises the implementation of the provisions of the tax law issued by the legislative authority and issues instructions to facilitate implementation in a manner that does not conflict with the texts and provisions of the law.
Bruno S,Frg & lars P-Feld p.73:2002	One of the parties to the tax accounting relationship, and it is her responsibility to gain the trust of the taxpayer and treat him with respect to improve the relationship between them.
(Nashed, 2008: 28)	It is responsible for imposing and collecting taxes in accordance with the law, and it may issue executive and explanatory instructions for implementing the law.

Table (6): Definition of tax administration

(Source: Prepared by the researcher based on the above sources)

Importance of Tax Administration:

The importance of tax administration is highlighted in two areas (Sharab, 20:2006):

A. Implementing tax laws in a way that ensures the protection of the rights of the state treasury and the protection of the rights of taxpayers alike.

B. Proposing the necessary amendments to tax laws with the aim of creating a modern tax law that suits the needs of society. In addition, the tax administration has major tasks, the most important of which are planning, organizing, directing and controlling.

As previously mentioned, the tax administration cannot carry out all tax accounting procedures in its comprehensive concept of (limiting, registering, collecting and collecting taxes) if there is no cooperation and support from governmental and non-governmental institutions that are required by the supreme financial authority in the state to provide information (quotes) about

their transactions with taxpayers (Ali, 2018:). The information received from these entities enables the administration to limit taxpayers and their taxable activities (Al-Kaabi, 2016: 86).

Article (4) of the Financial Instructions No. (5) of 2011 to facilitate the implementation of the provisions of the Law on Imposing Income Tax on Foreign Oil Companies Contracted to Work in Iraq No. (19) of 2010, as amended, obligated the supporting and related parties pursuant to these instructions to take the following measures:

Ministry of Oil: A percentage of (35%) thirty-five percent of the revenues due to foreign oil companies, their branches, offices and subcontractors shall be deducted after deducting the Ministry's share and sending it to the General Tax Authority within (30) thirty days from the date of payment of these amounts, provided that all these operations are officially documented, and these amounts shall be recorded as deposits to be settled when conducting tax accounting in accordance with the law.

Foreign Company: The following percentages shall be deducted from the total payment due to the subcontractor based on paragraph (4) of Article (28) of Income Tax Law No. (113) of 1982: "The Financial Authority may request from government departments, the socialist and mixed sectors, or any person to deduct a percentage not exceeding 10% ten percent of the amounts due to contractors or others associated with them, and the deducted amounts shall not be paid to them except after confirming their clearance from income tax. It may request the transfer of the deducted amounts to it":

A- (7%) seven percent of the oil contracts stipulated in Clause (First) of Article (1) of these instructions.

B- (3.3%) three and three tenths of a percent for other contracts not stipulated in (A) of this Clause.

Foreign company: It shall send the amounts stipulated in Clause (Second) of this Article to the General Tax Authority (Tax Administration) within (30) thirty days from the date of payment and shall record deposits to be settled when the final tax accounting is conducted, provided that the final payment due shall not be paid in full except when the tax accounting is conducted and the liability is cleared.

Tax Administration Procedures for Accounting for Oil Companies Contracts:

The Tax Administration operates under two main methods for tax accounting with oil companies, which are:

First: The self-assessment method (tax declaration): Self-assessment is one of the means used by the Tax Administration to determine taxable income, so the declaration submitted by oil companies is the basis or starting point for tax accounting (Al-Zaidi, 32:2014),

Second: The method of annual controls (hypothetical profits): Annual controls are defined as percentages set by the Tax Administration and according to which the tax base is determined (Kamash, 162:2002), and Al-Hilali defined them as hypothetical evidence of the taxpayer's annual income that the Tax Administration relies on to estimate the tax base according to the hypothetical estimation method (Al-Hilali, 2001:98), as reaching the real income is one of the

complex problems in developing countries characterized by a low level of tax awareness and widespread tax evasion, so the Tax Administration seeks to solve this problem by setting annual controls (hypothetical profits) to provide General rule for estimating taxpayers' income (Kamash, 2008: 7-8).

According to the annual-controls method, tax accounting procedures with oil companies are as follows: (Khader, 2013: 25-26).

1. Taxpayers (oil companies) submit all financial reports audited by the approved auditor to the tax administration within the legal period starting on (1/1) of the year following the realization of income until the end of (31/5) in accordance with paragraph (2) of Article (27) of the Income Tax Law.

2. The tax administration, when it is not convinced by the results of the business appearing in the financial reports, i.e. when the net profits appearing in the financial reports are less than the net profits reached according to the annual controls, then the tax base is determined in light of the controls, and according to these controls, the tax assessor in the tax administration calculates the estimated tax on taxpayers (oil companies) according to the following equations:

Revenues (audited financial reports) x hypothetical profit percentage of oil companies = taxable income.

Taxable income x tax scale (15% tax rate imposed on companies' income) = tax amount (payable according to the controls by oil companies).

3. The tax administration, according to Article (44) of the Income Tax Law, notifies taxpayers in writing to pay the tax and the period in which it must be paid, and the taxpayer's signature on the assessment memorandum is considered notification to him.

4. A representative of the company reviews the tax administration on the date specified for him to review what is stated in the assessor's memorandum.

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